

Using students' rationales for learning to individualize instruction

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This study reports on a case study of a student's rationales for studying mathematics. We operationalize Stieg Mellin-Olsen's educational concept of rationales for learning and apply the concept on data consisting of three semi-structured interviews with a student in the Swedish prison education program. Our analysis shows that the student's rationales vary considerably in strength over time, but also changes in character as a reaction to his educational contexts. We conclude that Mellin-Olsen's construct of rationales is useful for understanding students' changing motivation in relation to the teaching and to the practice of mathematics the teaching entails. Teachers may use the concepts from our analysis as cognitive tools, to think, talk and relate to students' rationales for learning. By identifying and acting on students' different rationales, opportunities arise for an individualized instructional design of mathematics courses.

That motivation can be of different types is well documented in research (Ryan & Deci, 2000). A common denominator for motivational theories is that they seek to answer how to get students to accept the basic premise of learning, schooling, and mastery of the material that the instructors prescribe are important (Graham & Weiner, 1996). Reflecting on the question: "Shall students adapt to teaching or shall teaching adapt to students?" we believe the latter is a more promising approach for organizing individualized instruction for adult mathematics learners. But, adapting teaching to students requires certain information of the students' driving forces for participating in the learning of mathematics.

In this presentation we report on a case study of an adult student's rationales for learning mathematics in prison. We elaborate on the question: How you can characterize students' motivation for studying mathematics in relation to their social and educational contexts based on a socio-political theoretical perspective. We use Mellin-Olsen's (1981; 1987) educational concepts, S-rationale and I-rationale for learning, as a conceptual framework. Mellin-Olsen defines the sociological S-rationale as follows:

This rationale for school learning I have called the S-rationale to indicate its social importance. It is the rationale for learning evoked in the pupil by a synthesis of his self-concept, his cognition of school and schooling, and his concept of what is significant knowledge and a valuable future, as developed in his social setting. (Mellin-Olsen, 1981, p. 357)

Different conceptions of what constitutes “good knowledge” may cause the student to have conflicting rationales for learning. While finding himself to be bored beyond belief by mathematics, he may very well be aware of the fact that mathematics is inevitable for moving on to the next level of the educational system. This reproduction of labor force, with mathematics as a gatekeeper, is represented by the I-rationale for learning:

It is the rationale, which is related to school’s influence on the future of the pupil, by the formal qualifications it can contribute. This role as an instrument for the pupil will provide the pupil with an instrumental rationale (I-rationale). In its purest form the I-rationale will tell the pupil that he has to learn, because it will pay out in terms of marks, exams, certificates and so forth. (Mellin-Olsen, 1987, p. 157)

Using these concepts, we show how a student’s rationales vary considerably in strength over time, but also changes in character as a reaction to his educational contexts. We also give examples of how the teacher successfully adapted the teaching situation to the student’s social setting.

Method

To investigate if one can use the educational concepts S- and I-rationales to characterize students’ motivation for studying mathematics, we conducted and analysed semi-structured interviews with imprisoned adults, studying mathematics in the prison education program. In this presentation we focus on one case, the student Bill. Drawing on Powell, Francisco and Maher’s (2003) principles for analysing video data, the interviews were recorded and all parts concerning Bill’s relation to mathematics were transcribed. We coded all critical events referring to Bill’s rationales for studying mathematics and categorized them as belonging to the S-rationale or the I-rationale for learning, in line with the operationalization described below. Thereafter we constructed a storyline, which formed the basis for a chronological narrative of Bill’s history of rationales for studying mathematics. While the timeline was constructed in relation to Bill’s chronological experiences from schooling, critical events relating to one time segment in Bill’s life came from different time points in the interviews.

Findings

We conclude that the theoretical construct of instrumental and sociological rationales for learning is useful for understanding students’ changing motivation in relation to the

teaching and to the practice of mathematics the teaching entails. Since the constructs are easy to apply, teachers can use them as cognitive tools, to think, talk and relate to students' rationales for learning. By identifying and acting on students' different rationales, opportunities arise for an individualized instructional design of mathematics courses.

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